

## Claims

1. Bipolar plate (5) for fuel cells, with the bipolar plate being provided on its surface with a layer (4) of a hydrophobing material soluble in a solvent.
- 5 2. Bipolar plate (5) in accordance with claim 1, with the hydrophobing material consisting entirely or partly of an amorphous fluoropolymer.
3. Bipolar plate (5) in accordance with claim 1, with the hydrophobing material consisting entirely or partly of  
10 a polysiloxane compound or of alkylsilanes, especially alkyl-aryl-silanes or halogen-alkyl-aryl-silanes.
4. Bipolar plate (5) in accordance with one of the previous claims in which the thickness of the layer (4) is adjusted to an optimum between a low electrical contact resistance to an  
15 adjoining electrode (7, 11) and a high hydrophobicity.
5. Bipolar plate (5) in accordance with one of the previous claims, with a thickness of the layer (4) ranging from 0.1 nm to 50 nm.
6. Bipolar plate (5) in accordance with claim 5,  
20 with of a thickness of the layer (4) ranging from 0.5 nm to 5 nm.
7. Bipolar plate (5) in accordance with one of the previous claims, with the bipolar plate (5) consisting of a metallic alloy, especially a nickel-based alloy.
- 25 8. Bipolar plate (5) in accordance with one of the previous claims, with a highly-conductive contact layer (6) made of a noble metal, especially gold, between the bipolar plate (5) and the layer (4) made of the hydrophobing material.

9. Fuel cell (1,2) with a membrane electrode unit (3) and, on the electrode side a bipolar plate (5) electrically contacting the membrane-electrode unit (3) in accordance with one of the previous claims.